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REMARKS

Claims 1-24 are pending in the present application. In the Office Action mailed May 6, 2005, the Examiner rejected claims 1, 2, 7, 8, and 10-24 under 35 U.S.C. §102(e) as being anticipated by Katscher et al. (USP 6,828,790). The Examiner next rejected claims 1-23 under 35 U.S.C. §103(a) as being unpatentable over Van Den Brink et al. (WO 01/96896), and further in view of Boskamp (USP 6,411,090). Claim 24 was rejected under 35 U.S.C. §103(a) as being unpatentable over Van Den Brink et al. in view of Boskamp, and further in view of Ibrahim et al.

In the Response filed February 17, 2005, Applicant submitted a Declaration under 37 C.F.R. §1.131 setting forth that the claimed invention was conceived prior to August 20, 2002. The Examiner has concluded, however, that "the effective date of Katscher et al. is earlier than the applicant's declaration date." Office Action, 5/6/05, p. 2. Applicant disagrees.

Contrary to the conclusion of the Examiner, the effective reference date of Katscher et al. is August 20, 2002 – not August 21, 2001. The reference was filed in the United States on August 20, 2002 and claimed priority of a foreign application filed with the European Patent Office on August 21, 2001. The foreign application was not an international application filed under the provisions of the Patent Cooperation Treaty. The foreign application was a national application that was filed directly with the European Patent Office. As such, the claim of priority to the foreign application is controlled by 35 U.S.C. §119(a). However, while the U.S. filing may claim the benefit of the foreign application filing date, the date the foreign application was filed is not the critical reference date for determining if and when the U.S. patent is prior art.

35 U.S.C. §102(e) states that a patent cannot be granted if "the invention was described in ... (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language." As stated above and evident on the face of the reference, Katscher et al. does not claim the priority of an international application filed under the provisions of the Patent Cooperation Treaty. As such, the exception set forth in 35 U.S.C. §102(e) is not applicable.

Therefore, as explained at MPEP §2136.03, "foreign applications' filing dates that are claimed (via 35 U.S.C. 119(a)-(d), (f) or 365(a)) in applications, which have been published as U.S. or WIPO application publications or patented in the U.S., may not be used as 35 U.S.C. 102(e) dates for prior art purposes." In other words, the critical reference date, i.e. the date for 102(e) purposes, of a U.S. patent that claims the priority of a non-PCT international application is

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the date the U.S. patent was filed. It is not the date the foreign application was filed. Therefore, in light of the provisions of 35 U.S.C. §102(c) and explained by the MPEP, the earliest effective reference date of Katscher et al. is August 20, 2002. As such, the antedating declaration filed on February 17, 2005 disqualifies Katscher et al. as prior art against the present application. Accordingly, Applicant requests withdrawal of the Katscher et al.-based rejection of claims 1, 2, 7, 8, and 10-24 under 35 U.S.C. §102(e).

The Examiner then rejected claims 1-23 under 35 U.S.C. §103(a) as being unpatentable over the combination of Van Den Brink et al. and Boskamp. The Examiner concluded that Van Den Brink teaches a method of MR imaging whereby a collective excitation is generated by a transmission coil to match a desired excitation profile and that Boskamp teaches independently driving each coil of a transmit coil array. The Examiner then concluded that the claimed invention is unpatentable because it would have been obvious to one skilled in the art to combine the teachings of the references to reduce unwanted artifacts and improve image quality. Applicant respectfully disagrees.

Van Den Brink et al. teaches an MR imaging system having an emission antenna system that includes emission coils for generating RF excitation pulses. See Abstract. The reference further discloses that "the system of emission antennae has a spatially inhomogeneous emission profile." Abstract. That is, the emission antenna system includes a system of surface coils that having "an excitation profile with spatial variations." Pg. 5, lns. 29-30. In other words, "the system of surface coils 13 preferably has a spatially inhomogeneous intensity distribution of the emitted RF pulses." Pg. 6, lns. 1-2. In this regard, Van Den Brink et al. teaches a surface coil arrangement that emits RF pulses that collectively form an inherently inhomogeneous excitation profile. The reference further teaches that since "the inhomogeneous pattern of the RF excitation is known prior to the reception of the magnetic resonance signal, the variations in the magnetic resonance signals which are due to the inhomogeneity of the RF excitation and the variations that relate to the composition and build-up of the object to be examined can be de-interleaved." Pg. 2, lns. 9-12. As such, "the magnetic resonance image can be reconstructed from the magnetic resonance signals on the basis of the RF excitation profile." Pg. 2, lns. 12-14.

In sum, Van Den Brink et al. teaches a reconstruction technique that utilizes *a priori* knowledge of the inhomogeneous RF excitation profile inherent in the RF emission antenna system of the MR scanner. In this regard, the reference teaches that "the emission profiles are derived, for example by performing calibration measurements on a homogeneous object and are stored in a working memory of the image processing unit." Pg. 6, lns. 30-32. Further, "the emission profiles stored are preferably updated at regular intervals in order to take into account

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deformation of the surface coils 13." Pg. 6, lns. 32-33. The reference continues, "To this end it is advantageous to update the emission profile each time when the surface coils are arranged on the patient to be examined." Pg. 6, lns. 33-34 – Pg. 7, ln. 1. Thus, it is clear from the reference that an excitation profile for an RF transmission system is what it is. It is a function of the construction of the transmission antenna. As such, calibrations are performed to determine what the inhomogeneous profile will be for a given scan so that such inhomogeneity can be considered during image reconstruction.

In contrast, the claimed invention calls for independently driving coils of a transmit coil array such that an excitation profile collectively formed by transmit coil array matches a desired excitation profile. As such, the claimed invention proactively defines an excitation profile. Van Den Brink et al. explicitly teaches a reactionary approach wherein an inherent inhomogeneous excitation profile is measured and used for image reconstruction. The reference neither teaches nor suggests manipulation of the excitation profile of a coil array by controlling the manner in which the RF transmission system is driven.

Similarly, Boskamp, which the Examiner relied upon in combination with Van Den Brink et al., fails to teach or suggest that which is claimed. Boskamp discloses a sixteen-rod birdcage coil that is driven by a single RF pulse that is split by a sixteen-way power splitter. See col. 3, lns. 66-67 – col. 4, ln. 1. The birdcage coil is thus driven by a single RF pulse that is split to drive each of the coil elements. However, this splitting of a single input to directly drive individual coil elements of a birdcage coil is not equivalent to independently driving coils of a transmit coil array.

That is, a single input is provided and that input is split to be directly fed to the individual coil elements of the single birdcage coil. However, while Boskamp teaches a phase shift between the sixteen inputs, Boskamp neither teaches nor suggests that one coil element can be driven without driving another coil element. In other words, all coil elements are driven from the same input and thus are dependent on the same input. The input may be split to drive the individual coil elements, but the driving of the sixteenth coil element necessarily requires the driving of the fifteenth coil element. Thus, the coil elements (assuming that each coil element constitutes a coil) are not independently driven as presently claimed.

Further, Boskamp teaches a single coil that has multiple elements. A single coil with multiple elements is not a multi-coil array. A multi-coil array is comprised of multiple coils which may be multi- or single- element coils. As such, the reference fails to teach or suggest a transmit coil array as claimed.

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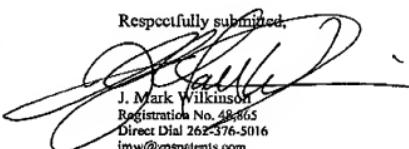
Therefore, Van Den Brink et al. fails to teach or suggest controlling the excitation profile of a transmission system to match a desired excitation profile and Boskamp fails to teach or suggest independently driving coils of a transmit coil array. Accordingly, it is believed that the Examiner's rejection under 35 U.S.C. §103 based on the combination of Van Den Brink et al. and Boskamp cannot be sustained.

Claim 24 was rejected based on the combination of Van Den Brink et al., Boskamp, and Ibrahim et al. While Applicant disagrees with the Examiner with respect to the art as applied, Applicant does not believe additional remarks are necessary as claim 24 depends from an otherwise allowable claim. Allowance thereof is, therefore, requested based on the chain of dependency.

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1-24.

Applicant appreciates the Examiner's consideration of these Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,



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